REMARKS

The rejection of claims 1, 21-26 and 29-43 under 35 USC 112, first paragraph, as failing to comply with the written description requirement is respectfully traversed.

Applicant has canceled claims 21-23, 25, 26, 31, 32, and 37-39, pursuant to this amendment leaving claims 1, 24, 29, 33-36 and 40-43 outstanding. In addition, claim 1 has been amended to correct the recitation of the concentration of Fe to read "0.004 wt%" to be consistent with page 6 of the specification. The earlier recitation was an obvious typographical error.

Accordingly, the rejection of claims 1, 21-26 and 29-43 under 35 USC 112, should be withdrawn.

The objections to claims 22, 25, 32 and 38 are now moot in light of the cancellation of such claims.

The rejection of claims 1, 21-26 and 29-43 under 35 USC §103 as being unpatentable over US Publication 2001/0055539 to Nakamura or JP 02047238 in view of US Patent 6,139,651 to Bronfin is respectfully traversed.

Attached hereto is a Declaration executed by Boris Bronfin, one of the joint inventors of the subject application, attesting to the unexpected results of the subject invention and clearly pointing out why none of the references cited by the Examiner taken individually or in combination render the composition as claimed in claim 1, obvious.

Applicant would first like to point out to the Examiner that a number of statements alleged by the Examiner as taught in the cited references are misleading or not taught at all and represent improper conclusions formed without proper foundation. More particularly, with regard to the Nakamura reference, the Examiner makes the statement that "Nakamura in Figs. 6, 8, 11, and 12 disclose tensile strength which indicate that the yield strength would be higher than the claimed minimum yield

strength". This is a false conclusion in that the composition as claimed requires exhibiting a tensile yield strength at 175°C of at least 150MPa. Claim 1, even as previously recited had a minimum tensile yield strength requirement of 150 MPa at elevated temperatures up to 175°C. .

In sharp contrast, Nakamura's alloys are intended only for ambient temperature applications and the tensile yield strength values at ambient or low temperature as taught in Nakamura relate to 25°C (see paragraph 0070 of Nakamura) and have no relationship to what is claimed. The fact that Nakamura's alloys are strong at room temperature does not provide any teaching to one skilled in the art as to what the tensile yield strength will be at a temperature of 175°C.

The following table, which is also taught in Table 5 in the attached Declaration of applicant, highlights the comparison between the tensile yield strength "TYS" values of Nakamura at 20°C and at 175°C, i.e., between a typical alloy of Nakamura (comparative example 27) and alloy example 6 of the subject invention, and teaches comparative "MCR" creep values:

	$TYS_{20°C}$	$TYS_{175°C}$	MCR
Applicants: Ex6	179MPA	165MPa	1.4
Nakamura: CompEx27	198MPa	121MPa	322

It is clear from the above table that the alloy of the subject invention has a TYS which varies by only 10% between 20°C and 175°C, whereas the Nakamura alloy varies in TYS by 40% over the same range and at the elevated temperature of 175°C Nakamura is well below the required minimum tensile yield strength of 150MPa.

The above table also shows that the alloy of the subject invention exhibits a minimum creep rate "MCR" of less than 1.7×10^{-9}/s, at 150°C as is required in claim 1, whereas Nakamura exhibits an MCR of 322, which is orders of magnitude above the required minimum claimed in claim 1. Accordingly, Nakamura clearly does not disclose

a tensile strength which indicates a yield strength higher than the claimed minimum yield strength at the claimed temperature of 175°C. Moreover, this is a false conclusion which the Examiner attributes to Nakamura as if it were clearly taught where instead no basis exists in Nakamura to support such a conclusion.

On page 4 of the Official Action, the Examiner also makes the following statement:

> "Bronfin discloses creep rate and tensile properties ...overlapping with the claimed properties...to be used at temperatures up to 150°C...with secondary creep rate less than 10^{-10}. ...Thus the claimed creep rates, tensile properties, and intermetallic compounds are clearly material properties which would have been inherently possessed by the materials of the cited references. (underlining added)."

The creep rates are expressed in the instant application as "minimum creep rates", and as "specific secondary creep rates" in Bronfin. A "specific secondary creep rate" is defined by Bronfin as the ratio of minimum creep rate and tensile yield strength (lines 51-52 at column 5 of Bronfin). A specific secondary creep rate of 10^{-10}, therefore, would correspond to 10^{-8} minimum creep rate. The lowest creep rate value in Table 4 of Bronfin, thus, provides: $5.1 \times 10^{-11} \times 155 = 7.9 \times 10^{-9}$. This minimum creep value is substantially higher than the minimum creep rate of the subject invention (see Table 5 of the instant application). Moreover, Bronfin tested at 135°C under load of 85 MPa and the instant application claims a minimum creep rate value (MCR) at 150°C under stress of 100 MPa.

Clearly the Examiner has again jumped to an erroneous interpretation of the disclosure in Bronfin disregarding the distinction between "secondary creep rate" which Bronfin expressly defines and "minimum creep rate". Had the Examiner not made this error, he would have realized that the minimum creep values of Bronfin are substantially higher than the minimum creep values called for in claim 1 of the subject invention and that in fact the minimum creep values of the subject invention constitute superior properties and which are clearly not self evident or inherent from the disclosure of Bronfin.

The Examiner uses the expression "material properties which would have been inherently possessed by the materials of the cited references" on page 4 of the Official Action. In light of the error made by the Examiner, no such inherent properties can in fact, exist. To the contrary, Bronfin teaches inferior properties.

The Examiner attributes "properties and characteristics" to the cited references which are not taught in the cited references and insists that in view of his erroneous conclusions , applicant must prove "unexpected results". This is pointed out, on page 6 of the Official Action where the Examiner makes the statement that "unexpected results have not been shown". Although, applicant does not believe "unexpected results" are warranted when based not on factual evidence but instead solely on conclusions of an Examiner clearly unsupported by the references, applicant has, nevertheless, indeed substantiated the existence of unexpected results.

High TYS and low creep rates of the instant alloys are demonstrated over the whole range of claimed elements in Examples 1-14 (Table 5 of the specification), whereas deviations from the claimed ranges have been shown to critically deteriorate the required properties (Comparative Examples 1-5 in Table 5).

To further substantiate the existence of "unexpected results", applicants have submitted a Declaration with annexed tables to which the Declaration refers, which positively demonstrates the unexpected results by means of comparison examples from the cited references. The comparison is done under identical conditions as required In re Brown, 173 USPQ 685 and In re Chapman, 148 USPQ 711. Moreover, the showing of the unexpected results does occur over the entire claimed range and is consistent with the requirements in In re Clemens and In re Colman, 205 USPQ 1172 as cited by the Examiner.

The Examiner on page 7 of the Official Action, continues to make conclusory statements unsupported by the recited references. More specifically, the Examiner makes the statement that the element calcium, which applicant argued was merely an optional selection in Nakamura, is specifically taught in Nakamura as claimed in the subject application. Nakamura does not claim or teach the use of any

specific calcium concentration range. Instead, calcium is only an optional selection from a group of about 16 elements and is optionally selected together with any other of the elements of that group (claim 10 of Nakamura application). Accordingly, the Examiner is again attributing a conclusion to what is not actually taught in the cited reference.

For example, in Example 9 of Nakamura, which relates to the corrosion rate, no special corrosion advantages is shown to exist if the alloys contain Ca. Example 8, in which Si is used and not Ca, appears in Figure 6. Example 9 is missing in all Figures of Nakamura that relate to strength. The absence of Example 9 in Figures 3, 5-9, and 11 which relate to strength teaches one skilled in the art of the absence of any advantages to be derived from calcium in Nakamura's alloys.

The Examiner on page 7 of the Official Action, also makes the statement that "it is known that TYS is about 80% of UTS which is still higher than the claimed minimum TYS".

This statement is simply not true. Many examples are known in the art where two alloys have the same UTS but significantly different TYS values.

As regards the cited reference JP '238, the Examiner further makes the statement that "the listing of numerous solutions to a problem does not make any one solution less obvious". It should be noted that JP '238 does not relate to the problem addresses or solved in the instant application. JP '238 provides a magnesium hydride for vibration dumping, whereas the instant invention provides magnesium alloys for high mechanical loads at high temperatures. It is not clear which problem was solved in JP '238, but the instant application teaches alloys having superior TYS and MCR associated with high heat stress exerted on engine parts made of light alloys. Accordingly, how does the JP '238 teaching relate to the problem addressed in the subject application and/or its solution? The Examiner's reference to the listing of numerous solutions to a problem is out of context and inapplicable where the cited reference does not address the same problem.

The Examiner is applying a reference JP '238 which does not relate to the problem solved in the instant application and is making allegations relative to the teaching of this reference which has no relevance other than in the mind of the Examiner. Stated otherwise, the conclusions of the Examiner are not substantiated by the teaching in the reference which is a basic requirement of 35 USC 103.

The JP document discloses a magnesium hydride comprising 15 elements not present in the instant alloys for use in vibration-damping at ambient temperatures. No skilled person would either expect or find any information in this document relating to hydrogen-free compositions for high temperatures. Accordingly, the cited reference JP '238 is irrelevant to the subject invention.

As indicated earlier, applicant has amended claim 1 to define the magnesium based alloy tensile yield strength characteristics as having a yield strength of at least 150 MPa at 175°C. The alloys of Nakamura as explained earlier are intended for ambient temperature applications and do not possess the properties claimed in claim 1.

Bronfin also teaches alloys intended for relatively lower temperature applications up to 150°C and preferably up to 135°C. In addition, as regards creep rate, claim 1 requires the alloy to exhibit a minimum creep rate MCR of less than 1.7×10^{-9}/s at 150°C under stress of 100 MPa. As explained earlier, and as is shown above in the comparative table of example 6 and the comparative example 27 of Nakamura, neither Bronfin nor Nakamura teach the required minimum creep rate. The alloys in Bronfin were measured at 135°C under 85 MPa and still show a much worse creep rate than that of applicants alloys at the higher temperature of 150°C and at higher stress of 100 MPa.

Moreover, the Bronfin alloys comprises rare-earth elements and calcium from 0.2 to 1.2 wt% and do not disclose tin, whereas the alloy of the instant application requires the composition to include tin and a calcium concentration of from 1.8 to 3.2 wt. % and does not include rare-earth elements. The Examiner has not presented a clear understanding of how the Examiner, much less one skilled in the art, would apply the alloys of Bronfin to the alloy of the subject application as claimed.

Furthermore, the alloy of the subject invention are also distinguished by intermetallic compounds not present in Bronfin as is further claimed in claim 41. There is no basis from the teaching of Bronfin for any of the assumptions made by the Examiner concerning the variations of the Bronfin alloys with the alleged variations representing unsupported allegations based on misleading or false conclusions from the actual teaching of the reference.

The attached Declaration of applicant serves as factual evidence of the unexpected results achieved by the composition of the subject invention, based upon comparisons under identical conditions and over the entire claimed range. The Declaration also provides a detailed explanation as to why the cited references do not teach one skilled in the art the composition of the subject invention necessary to exhibit the properties of yield strength and minimum creep rate under the conditions defined in claim 1. Upon evaluation of the enclosed Declaration, if the Examiner deems the Declaration not to provide the factual evidence which applicant clearly believes is demonstrated, applicant requests a personal interview to discuss any deficiency the Examiner may feel still exits in the Declaration.

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Reconsideration and allowance of claims 1, 24, 29, 33-36, and 40-43, is respectfully solicited.

Respectfully submitted,

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MAILING CERTIFICATE

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as first class mail in an envelope addressed: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 20231-1450 on May 12, 2004.